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PENSOFT

New distributional record of *Anthrenus dorsatus* Mulsant & Rey, 1868 (Coleoptera, Dermestidae) on the island of Mallorca, Spain

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Abstract

The carpet beetle *Anthrenus dorsatus* has previously been recorded from North Africa and Malta. During a recent visit to the island of Mallorca several *Anthrenus* species were collected which included a number of *Anthrenus dorsatus* specimens. This record adds a new species both to the island of Mallorca and to the Spanish checklist. These records extend our knowledge of the distribution of *A. dorsatus* and provide more evidence of range expansion in the *pimpinellae* species group across Europe, possibly because of global climate change.

Key words

Anthrenus pimpinellae; distribution; aedeagus; sternite; antenna; climate change.

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Introduction

The genus *Anthrenus* Geoffroy, 1762 in the family Dermestidae is a species-rich taxon (Háva 2015). The genus is split into 10 subgenera and the number of species in some of these groupings is still unknown. In a review of the Palaearctic species of the *Anthrenus pimpinellae* species group, Kadej et al. (2007) listed 18 species but also pointed out that many specimens remain with unclear taxonomic status. Since then, Kadej and Háva (2011) have added a further 3 species to the Palaearctic list. A total of 97 species of Dermestidae have been recorded from Spain (Anon 2018) including 7 species (plus 2 subspecies) from the *A. pimpinellae* species group. *Anthrenus dorsatus* Mulsant & Rey, 1868 sits within the *A. pimpinellae* group and was raised to specific status by Háva (2003). Háva (2003) noted the species from Algeria from a specimen held at the Muséum National d'Histoire Naturelle, Paris, France. Further specimens were located by Kadej et al. (2007) in the Muséum d'Histoire Naturelle de Lyon, Lyon, France which extended distribution to include Tunisia and Malta. Here we document a new record for *Anthrenus dorsatus*, extending the known distribution to include the Balearic island of Mallorca.

Methods

An exploratory visit was made to the Balearic island of Mallorca from 5 to 12 May 2018 to collect Dermestidae. The sites visited are shown in Figure 1. All individuals were aspirated using a pooter from roadside Apiaceae, in particular *Daucus carota* L. Whilst in Mallorca, collections were kept at 4 °C. They were returned to the UK live and dissected as fresh specimens. Species were separated using the descriptions provided by Kadej et al. (2007). All individuals collected were dissected under a Brunel BMSL zoom stereo LED microscope and identification

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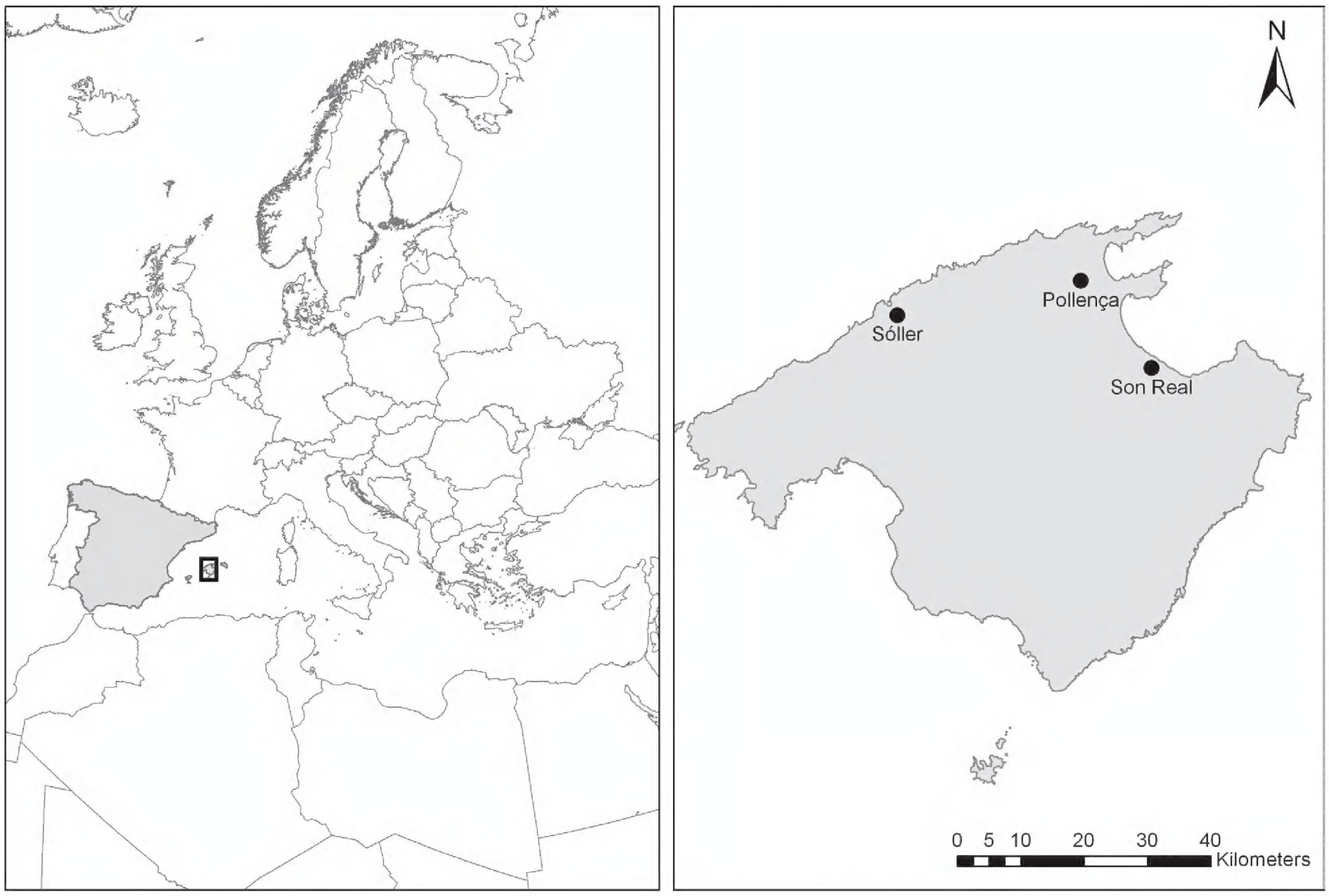

Figure 1. Map of the Balearic island of Mallorca indicating position in the Mediterranean relative to Spain and the 3 collection sites.

was based on antennal, aedeagus and sternite IX structure. Images were taken using a Canon EOS 1300D and fed through Helicon Focus 6 Pro focus-stacking software. Habitus images were captured at ×20. Images of sternite IX, aedeagus and antennae were captured at ×100 using a Brunel monocular SP28 microscope. Morphometrics were taken using DsCap.Ink software. Voucher specimens are lodged with The Cole Museum of Zoology, University of Reading (REDCZ) and private collection of GJH (GJHPC).

Results

New records. Spain: Mallorca: Pollença (39°85′23″ N, 003°04′00″ E), 7 May 2018, G.J. Holloway and A. Callaghan, 1 male (Fig. 2) (REDCZ, 3226), 2 males (GJHPC 980 & 981). Spain: Mallorca: Sóller (39°85′23″ N, 003°18′25″ E), 8 May 2018, G.J. Holloway, 1 male (GJHPC 982). Spain: Mallorca: Son Real (39°73′74″ N, 003°18′25″ E), 9 May 2018, G.J. Holloway, 1 male (GJHPC 983).

By far the commonest species found was *A. verbasci* (Linneaus, 1767) (1100 individuals). Even when many individuals across several species of *Anthrenus* were present and a variety of feeding options (flowers) were available, they were still virtually entirely restricted to Apiaceae. On the odd occasion when a specimen was found feeding elsewhere, the flower on which it was found was always white or had a large component of white in the flowerhead.

Identification. Identification was confirmed using a combination of characters. Abdominal ventrites vary between species and the large dark spots at the outermost edge of sternite I (Fig. 3) are features not shared by all

Figure 2. Habitus of male *Anthrenus dorsatus* Mulsant & Rey, 1868, Mallorca, May 2018.

Figure 3. Abdominal ventrites of *Anthrenus dorsatus* Mulsant & Rey, 1868, Mallorca, May 2018, indicating dark patch at outer margin of sternite I.

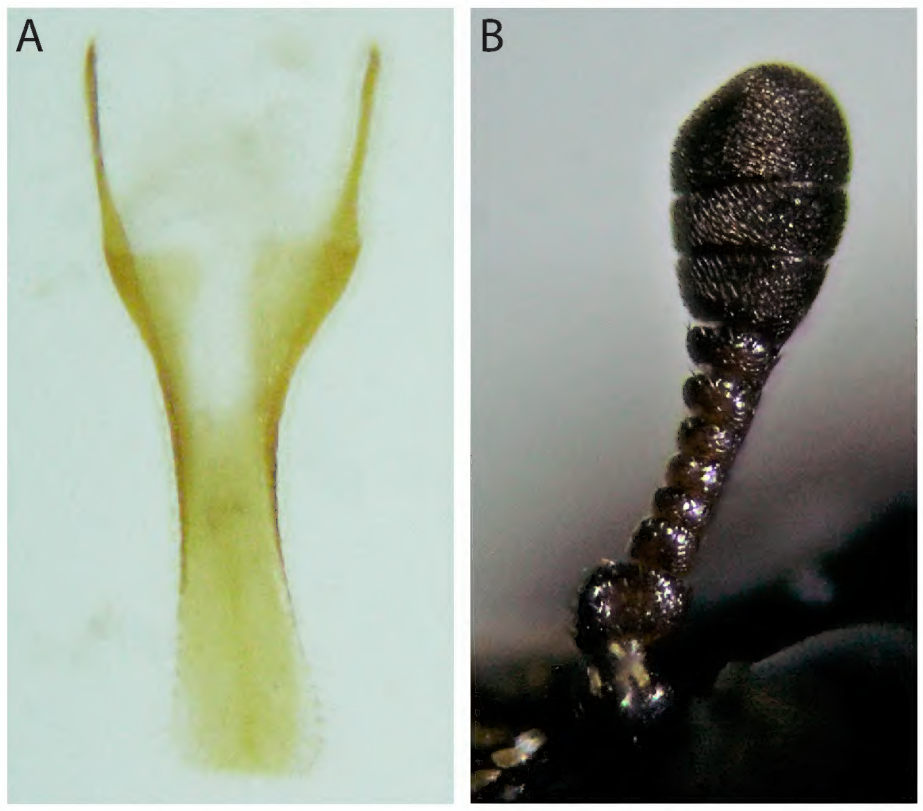

Figure 4. Sternite IX (**A**) and antenna (**B**) of *Anthrenus dorsatus* Mulsant & Rey, 1868, Mallorca, May 2018. Note the flaps folding inwards from the sternite projections, the shape of the base and the distribution of marginal setae. The antennal club is asymmetric with wide sutures separating the antennal segments.

pimpinellae spp. (Herrmann 2018). Stronger features are the characteristic structure of sternite IX (Kadej et al. 2007) and the antennae (Kadej et al. 2007; Herrmann 2018) (Fig. 4). Sternite IX of *A. dorsatus* has flaps folding inwards across the sternite projections. The shape of the base of sternite IX and the distribution of marginal setae closely match the illustration provided by Kadej et al. (2007). The 11 segmented antennae have relatively broad, asymmetric, 3-segmented clubs displaying wide sutures between segments 9, 10 and 11 (Fig. 4). Antennal segments 3–7 join closely to each other and there was a clear gap between segments 7 and 8, and between segments 8 and 9 (Fig. 5) (Kadej et al. 2007). Identification is supported by the general structure of the aedeagus (Fig. 5) (Kadej et al. 2007, Herrmann 2018), for example, the broad parameres and the narrow tip to the median lobe. Body length (leading edge of pronotum to tip of elytra) ranged from 2.34 mm to 3.54 mm, which extends the body size range reported by Kadej et al (2007). There was no difference between male and female body lengths.

Figure 5. Aedeagus of *Anthrenus dorsatus* Mulsant et Rey, 1868, Mallorca, May 2018. **A.** Ventral view. **B.** Dorsal view.

Discussion

The Dermestidae are a poorly studied group. This point is illustrated by the rate at which new species are being discovered (Háva 2015). Háva (2015) claimed that the number of species of Dermestidae described has increased from 1196 to 1648 in the space of 15 years, an increase of over 37%. Whilst work is being carried out describing new species at the global and local level, our knowledge of the wider distribution and biology of nearly all these species remains unknown. It is also likely that the distributions of many dermestids are changing in the face of global climate change. For example, Foster and Holloway (2015) recorded *A. angustefasciatus* Ganglbauer, 1904 new to the UK and provided evidence that this species was spreading north and west across Europe. The same could be happening with *A. dorsatus*. Recent work describing the dermestid fauna from Italy (Nardi and Háva 2013), Sardinia (Háva and Nardi 2011), and northern Spain (Háva et al. 2010) did not include *A. dorsatus*. *Anthrenus dorsatus* has only been recorded from Algeria and Tunisia in North Africa and Malta, so Mallorca represents the most northerly and westerly location for the species recorded so far. This is a new record for Spain and extends our knowledge of the distribution of this species in Europe.

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Authors' Contributions

GJH and AC collected the data. GJH wrote the text, proof read and modified by AC. CFW provided the maps.

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